



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/824,643	04/15/2004	Paul Moroz	071469-0306094 (PC6047A)	7681
Eric Strang Suite 10 4350 W. Chandler Blvd. Chandler, AZ 85226				
7550	11/07/2008	EXAMINER KACKAR, RAM N		
ART UNIT			PAPER NUMBER	
1792				
MAIL DATE			DELIVERY MODE	
11/07/2008			PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/824,643

Applicant(s)

MOROZ, PAUL

Examiner

Ram N. Kackar

Art Unit

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 September 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-31 is/are pending in the application.
- 4a) Of the above claim(s) 25-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S5108)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(c), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(c) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/23/2008 has been entered.

Claim Objections

2. Claim 8 is objected to because of the following informalities:

Claim 8 depends upon cancelled claim 2. Appropriate correction is required. For the purpose of this examination it is assumed to depend upon claim 1.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1 and 3-24 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In this instance the limitation “an inlet distribution unit that is in fluid communication with the channel of the thermal assembly and the first and second fluid units, the inlet distribution unit being constructed and arranged to control an amount of the flow rate, of the controlled heat transfer fluid returning from the channel of the thermal assembly and flowing to the first fluid unit and control a remaining amount of the flow rate of the controlled heat transfer fluid returning from the channel of the thermal assembly and flowing to the second fluid unit;” especially the underlines part is a new matter.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. **Claims 1, 3-13, 15-16, 18 and 21-24 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Mitrovic et al (WO 03/012567).**

Mitrovic et al discloses a system for controlling the temperature of multiple component surfaces (Abstract) in a processing chamber by circulating heat transfer fluid (Fig 3), first fluid unit (50) and second fluid unit (52) which could be independently temperature controlled where the temperature control is obtained while using temperature sensors (thermocouples 22 and 24 controlling in a feed back loop, the flow of these fluid units in to a mixer (part of outlet flow control unit as in Fig 3-54 and Paras. 22 and 20) before distributing to components. Mitrovic et

al further disclose inlet distribution unit to allow the returning fluid to go back to fluid units (Fig 3-56).

7. Claims 1, 3-5, 9-11, 14-16 and 20-24 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Schaper et al (US 5802856).

Schaper et al discloses a system for controlling the temperature of a substrate holding surface (Fig 3 and abstract) by circulating heat transfer fluid from plurality of fluid units (64, 66, 68) which could be heated or cooled and where the temperature control is obtained by controlling in a feed back loop, the flow of these fluid units controlled and arranged at different temperature using controller and sensors (Abstract, Fig 5 and 46, 48, 50, 52). Schaper et al further teach finer control of temperature using thermoelectric modules (Abstract). The substrate-holding surface could hold the substrate by electrostatic chuck or vacuum (Col 4 lines 35-40). Schaper et al disclose closed loop flow mechanism where the returning fluid comes back to be reused. Further Schaper et al disclose alternative means of temperature control by mixing fluids of two temperatures in different proportions (Col 6 line 63- Col 7 line5 and Fig 8).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1, 3-13, 15, 18 and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reginald Hunter (US 6026896) in view of Mandrekar et al (US 6117245).

Reginald Hunter discloses a system for controlling the temperature of multiple components in a processing chamber including substrate holding surface (Col 1 lines 49-54) by circulating heat transfer fluid (Fig 3), first fluid unit and second fluid unit (18 and 54) which could be heated or chilled (Abstract) and where the temperature control is obtained by controlling in a PID feed back loop, the flow of these fluid units controlled and arranged at different temperature (Col 1 line 61-Col 2 line 11, Fig 3, Col 3 lines 22-26) while using temperature sensors (Fig 1-36). The use of such a temperature control device is in a processing chamber using CVD, PVD, plasma etching and other processing. Hunter discloses closed loop flow mechanism where the returning fluid comes back to be reused.

Reginald Hunter does not explicitly disclose alternative means of temperature control by mixing fluids of two temperatures in different proportions.

Mandrekar et al discloses a system for controlling the temperature of multiple components in a processing chamber by circulating heat transfer fluid (Fig 2), first fluid unit (50) and second fluid unit (52) which could be heated or cooled and where the temperature control is obtained while using temperature sensors (Abstract) by controlling in a PID feed back loop, the flow of these fluid units in to a mixer (Fig 2-64, Fig 3 and Col 6 lines 11-37) before distributing to components. Regarding the limitation of mixer, Mandrekar discloses that the valve 64 mixes the two flows (Col 6 lines 29-31) in its chamber. Inherently, 64 has several surfaces which help mechanical mixing.

Therefore it would be obvious for one of ordinary skill in the art at the time of invention to have used temperature control by mixing temperature control fluids in different proportion in the apparatus of Hunter to get a system where smooth change of temperature would also be fast.

10. Claims 1, 3-5, 9-11, 14-16 and 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schaper et al (US 5802856) in view of Mandrekar et al (US 6117245).

Schaper et al discloses a system for controlling the temperature of a substrate holding surface (Fig 3 and abstract) by circulating heat transfer fluid from plurality of fluid units (64, 66, 68) which could be heated or cooled and where the temperature control is obtained by controlling in a feed back loop, the flow of these fluid units controlled and arranged at different temperature using controller and sensors (Abstract, Fig 5 and 46, 48, 50, 52). Schaper et al further teach finer control of temperature using thermoelectric modules (Abstract). The substrate-holding surface could hold the substrate by electrostatic chuck or vacuum (Col 4 lines 35-40). Schaper et al disclose closed loop flow mechanism where the returning fluid comes back to be reused.

Further Schaper et al disclose alternative means of temperature control by mixing fluids of two temperatures in different proportions (Col 6 line 63- Col 7 line5 and Fig 8).

Schaper et al do not disclose details of mixing the fluids.

Mandrekar et al disclose a system for controlling the temperature of multiple components in a processing chamber by circulating heat transfer fluid (Fig 2), first fluid unit (50) and second fluid unit (52) which could be heated or cooled and where the temperature control is obtained while using temperature sensors (Abstract) by controlling in a PID feed back loop, the flow of

these fluid units in to a mixer (Fig 2-64, Fig 3 and Col 6 lines 11-37) before distributing to components.

Therefore it would be obvious for one of ordinary skill in the art at the time of invention to have used temperature control by mixing temperature control fluids in different proportion in the apparatus of Schaper et al to get a system where smooth change of temperature would also be fast.

11. Claims 12-14 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reginald Hunter (US 6026896) in view of Mandrekar et al (US 6117245) as applied to claims (1-13, 15, 18 and 21-24) and further in view of Kanno et al (US Pub 2003/0164226).

Reginald Hunter in view of Mandrekar et al, as discussed above discloses the use of such a temperature control device in a processing chamber using CVD, PVD and plasma etching but does not explicitly disclose vacuum, RF and lift pins which are normally used in automated processing of semiconductor wafers as disclosed explicitly by Kanno et al (Fig 1- Fig 20).

Therefore using the disclosed temperature control device in an apparatus like disclosed by Kanno et al would have been obvious for precise and uniform temperature control of the substrate for process control and optimization.

12. Claims 6-8 are also rejected under 35 U.S.C. 103(a) as being unpatentable over Reginald Hunter (US 6026896) in view of Mandrekar et al (US 6117245) as applied to claims (1-13, 15, 18 and 21-24) and further in view of Shultz et al (US 4060997).

Subject matter of these claims is inherent in the device disclosed by Reginald Hunter; nevertheless Shultz et al disclose a chiller with temperature sensors and fluid level sensors to keep the fluid replenished at constant level for the proper functioning of the heat exchangers. (See Fig 1 and its description).

Therefore subject matter of these claims would have been obvious to one of ordinary skill in the art at the time of invention in order to ensure proper functioning of the heat exchangers.

Response to Arguments

Applicant's arguments filed 9/23/2008 have been fully considered but they are not persuasive.

Applicant argues that Mitrovic et al. fails to teach or suggest an inlet distribution unit that is in fluid communication with the channel of the thermal assembly and the first and second fluid units, the inlet distribution unit being constructed and arranged to control an amount of the flow rate of the controlled heat transfer fluid returning from the channel of the thermal assembly and flowing to the first fluid unit and control a remaining amount of the flow rate of the controlled heat transfer fluid returning from the channel of the thermal assembly and flowing to the second fluid unit.

In response it is noted that Mitrovic et al disclose returning fluid to be separated to the two fluid units at two flow rates (Fig 3 -56). Further since the fluids could be mixed down stream (54) of the inlet distribution valve it would make sense to control the flow upstream at valve (56). It is further noted that the disclosure in Mitrovic is at least as detailed and specific as in the applicant's disclosure.

In response to applicant's argument against the combination of Reginald Hunter and Mandrekar et al, since Mandrekar discloses a mixer to mix two fluids in controllable proportion, it is necessary that the combination will have to have a valve to control flow rates of each fluid. Same argument foes for the combination of Schaper et al and Mandrekar et al.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ram N. Kackar whose telephone number is 571 272 1436. The examiner can normally be reached on M-F 8:00 A.M to 5:P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571 272 1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ram N Kackar/

Application/Control Number: 10/824,643

Page 10

Art Unit: 1792

Primary Examiner, Art Unit 1792